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CASE REPORT

Reducing acute stress in a 16-year old using trauma-focused cognitive behaviour therapy and eye movement desensitization and reprocessing

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Abstract

Objective: To assess the effects of trauma-focused cognitive behaviour therapy (TF-CBT) and Eye Movement Desensitization and Reprocessing (EMDR) for the treatment of acute stress in an adolescent.

Methods: A combination of TF-CBT and EMDR was provided to a 16-year-old girl with distressing memories, anxiety and flashbacks. For measurement of the efficacy of the treatment package, the Children's Revised Impact of Event Scale (CRIES-13) was used.

Results: Acute stress reactions decreased considerably after treatment and remained stable. CRIES-13 scores showed substantial reduction in stress scores. The girl reported no more flashbacks of the injury, sleeping difficulties or recurrent and distressing memories.

Conclusion: This case study illustrates the potential efficacy of a combination of TF-CBT and EMDR for patients with acute stress reactions. Future studies should examine the efficacy of this treatment package in a large sample of children.

Keywords: Spinal cord injury, cognitive behaviour therapy, eye movement desensitization and reprocessing, acute stress, paediatric intensive care unit

Introduction

After a life-threatening medical event, some children may develop a range of acute stress reactions, such as intrusive unpleasant thoughts, distressing memories and frightening dreams [1]. Initially acute stress reactions are a normal response to a stressful event [2]. Only some children will show pathologic and chronic stress reactions, resulting in acute stress disorder (ASD) or posttraumatic stress disorder (PTSD) [3]. ASD refers to children with pathologic stress reactions in the initial month after a stressful event, whereas PTSD is diagnosed if the duration of the stress reaction is 3 months or more [4].

Few studies in paediatrics have documented prevalence rates of ASD. Two studies, based on DSM-IV criteria, show ASD symptoms in 22–30% of children after paediatric injury [5,6]. PTSD on the other hand has been documented extensively. Research has particularly been focused on cancer, burns, diabetes and accidents. The reported prevalence of PTSD in paediatrics varies between 5–35% depending on the population studied [7–9]. Stress reactions can result in substantial impairment of social, psychological and academic functioning, if they are not diagnosed and treated properly [10].

Children with ASD or PTSD may show different stress reactions depending on their age and

developmental stage [11]. Young children may report generalized fears, separation anxiety, sleep disturbances, agitated behaviour and posttraumatic play. In addition, young children may lose acquired developmental skills (e.g. independent toileting skills). School aged children may describe persistent reliving of the stressful event in vivid memories and nightmares. They can also experience symptoms of increased arousal, such as sleeping or concentration problems, accompanied by physical symptoms. Furthermore, school aged children can avoid situations or places that remind them of the stressful event or may become less responsive emotionally, depressed and withdrawn socially. Adolescents show similar stress reactions, but they are more likely to exhibit impulsive and aggressive behaviours in comparison to younger children [4,12]. Comorbidity may become manifest, e.g. anxiety, substance abuse and depression [13].

Interventions for ASD can be valuable for prevention of PTSD and for giving support to children in their return to optimal functioning after a life-threatening medical event [6]. There is limited research on the efficacy of psychological treatments for children with ASD. There is some growing support for the efficacy of trauma-focused cognitive behaviour therapy (TF-CBT) for the treatment of ASD [14,15], although, this research has focused mainly on sexually abused children. Other interventions, such as psychological debriefing (PD) or Eye Movement Desensitization and Reprocessing (EMDR), have not been adequately studied to date [14]. One randomized controlled trial among children involved in road traffic accidents showed no effect for PD provided 4 weeks after the accident [16], a finding that is consistent with earlier adult research [17]. Empirical support for EMDR as an effective early intervention for ASD in children is currently lacking, but the approach appears promising for children with chronic PTSD [18–22]. A recent Cochrane review on psychological treatment for PTSD in adults shows favourable results for EMDR [23]. More research is needed to test potentially effective early treatments for children. The aim of this case study was to assess the effects of trauma-focused cognitive behaviour therapy (TF-CBT) and Eye Movement Desensitization and Reprocessing (EMDR) for the treatment of acute stress in an adolescent.

Methods

Participant

The participant was a 16-year-old girl (Sophie) who developed flashbacks, distressing memories, anxiety and severe sleeping problems at a paediatric

intensive care unit (PICU). Sophie acquired a spinal cord injury due to a diving accident during a family-vacation abroad. Three days after Sophie's admission at the PICU, the medical staff referred her for assessment and treatment of severe acute stress reactions.

Sophie suffered from frightening memories at the PICU. The memories included a sense of reliving the event during the day. Therefore, she was constantly alert and nervous and felt unsafe at the PICU. A psychologist at PICU started with four sessions of TF-CBT including stress management techniques, relaxation, psycho-education and cognitive restructuring. After these sessions Sophie's worries and appraisals about the injury changed and she felt more secure at the PICU. However, she remained anxious, kept flashbacks and sleeping problems. This was considered as an indication for EMDR.

EMDR procedure

Support for the use of EMDR in the treatment of PTSD can be found in ~20 randomized controlled studies in adults [24]. In children, research on EMDR is lacking behind, but findings are encouraging and tentatively suggest significant improvements in a range of areas [25,26]. EMDR is now recommended as one of the first choice treatments for PTSD—together with prolonged exposure and cognitive restructuring—in several practice guidelines [4,27,28]. The treatment aims to resolve symptoms resulting from disturbing memories of stressful life experiences, with a highly structured procedure. During this procedure, first all aspects of the memory-representation are activated: image, cognitive, emotional and physical sensations. When this is achieved the patient is asked to focus internally on emotionally disturbing information, evoked by the memory and simultaneously externally on bilateral stimulation (e.g. following the horizontally moving fingers of the therapist with the eyes, listening with earphones to tones similar to ticking of a clock alternately in each ear or hand-tapping). Following each set of dual attention (internal and external) during 30–45 seconds, the patient is asked to report shortly whatever comes to mind. This alternating process of giving dual attention and making notice of whatever changes is repeated until the arousal evoked by the memory is neutralized. The distress level is rated by the Subjective Units of Disturbance Scale (SUDS) from 0 (meaning neutral) to 10 (meaning maximal distress) [29]. This scale is used for measuring the subjective intensity of disturbance or distress currently experienced and functions as a benchmark to evaluate the progress of treatment.

This approach is based on a theoretical model of incomplete information processing. In this model, it is assumed that trauma causes a blockade in the natural physiological information-processing system, because the system gets overwhelmed by trauma-related information. So the unprocessed information is consolidated in a dysfunctional, state-dependent way, causing psychopathology [30]. The EMDR procedure supposedly facilitates completion of the information-processing system and enables the information-system to reprocess, integrate and store the information properly on an adaptive level.

EMDR session

The psychologist at the PICU explained the rationale and principles of EMDR. For clarification of the procedure, Sophie was given a set of bilateral stimulation with earphones. Next, the psychologist asked Sophie to focus on the most distressing image of her memory. Guided by the protocol all elements of the memory were accessed and activated: (1) the *image* of the memory that generated the highest arousal in the present, (2) the negative and positive *cognitions* associated with this image, (3) the *emotions* and (4) the *bodily sensations*. Sophie chose the following image (1): 'I am in the water, my mouth and eyes are open. I am floating and cannot feel my hands'. Her negative cognition (2) was: 'I am in danger' and her positive cognition: 'I am safe now'. Her emotion (3) was: panic. Her SUDS level was: 10. And she felt this distress foremost in her belly (4). Consequently, Sophie was asked to focus *internally* on the disturbing information and at the same time *externally* on the bilateral stimulation (earphones). After each set of dual attention (internal and external) for 30–45 seconds, Sophie reported whatever changes she noticed. This process

continued during 20 minutes until there was a marked improvement in distress with a SUD level of 0. Thereafter the positive cognition was installed. The psychologist closed the session after 50 minutes with an evaluation with both Sophie alone and with her parents present.

Measures

To measure the efficacy of the EMDR session, Sophie completed the Children's Revised Impact of Event Scale (CRIES-13) [31]. This is a brief self-report designed to screen children at risk for PTSD and is divided into three clusters: Hyperarousal, Intrusions and Avoidance. A cut-off score of 30 is used for children at risk (range 0–65). The measure has excellent reliability, good face and construct validity, a stable factor structure, correlates well with other indices of distress and has been used to screen very large samples of children following a wide range of stressful events [32]. Sophie completed the CRIES 1 day before EMDR treatment, 2 days after treatment and at a 5-month follow-up. Sophie's parents assisted her to complete the questionnaires.

Results

Evaluation and PTSD scores

Sophie had a re-evaluation session with the psychologist a couple of days after the EMDR session. She reported no more flashbacks, distressing memories nor difficulties with sleeping and medication could be reduced. She described the EMDR session as a positive experience for her. The CRIES-13 scores showed reductions in total stress scores as well as improvements on all clusters: Hyperarousal, Intrusions and Avoidance (Table I and Figure 1).

Table I. CRIES scores before EMDR, after EMDR and at the 5-month follow-up.

	Before EMDR	After EMDR	Follow-up
<i>Hyperarousal</i>			
1. Concentrating problems	5 = often	5 = often	3 = sometimes
2. Easily startled, nervous	3 = sometimes	3 = sometimes	1 = rarely
3. Easily irritable	5 = often	1 = rarely	3 = sometimes
4. Watchful	0 = not at all	0 = not at all	3 = sometimes
5. Sleeping problems	5 = often	1 = rarely	0 = not at all
<i>Intrusions</i>			
6. Think about the injury	3 = sometimes	0 = not at all	1 = rarely
7. Suddenly strong feelings	5 = often	5 = often	3 = sometimes
8. Pictures pop into mind	3 = sometimes	1 = rarely	0 = not at all
9. Many things keep reminding	3 = sometimes	0 = not at all	1 = rarely
<i>Avoidance</i>			
10. Remove it from your memory	5 = often	0 = not at all	0 = not at all
11. Stay away from reminders	3 = sometimes	3 = sometimes	0 = not at all
12. Try not to talk about it	1 = rarely	0 = not at all	0 = not at all
13. Try not to think about it	0 = not at all	0 = not at all	0 = not at all
Total	41	19	15

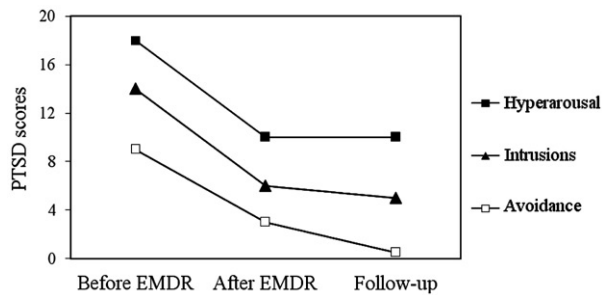


Figure 1. CRIES scores on all clusters before EMDR, after EMDR and at the 5-month follow-up.

Anecdotally, her parents reported positive effects. The week thereafter Sophie was discharged from the hospital to a rehabilitation centre. Nevertheless, the psychologist decided to monitor Sophie by telephone a few times after discharge to check if the decrease in acute stress reactions persisted and if she needed more EMDR sessions. During these phone contacts anxiety and hyperarousal symptoms were reported even less and less frequently. The psychologist decided to end therapy and psychosocial support would be continued at the rehabilitation centre if necessary. Low stress scores were maintained at a 5-months follow-up (Table I and Figure 1).

Discussion

This case study appears to illustrate the potential efficacy of EMDR for paediatric patients with distressing memories and flashbacks during their stay at the PICU. However, as Sophia also received TF-CBT, one cannot rule out the possibility that this treatment contributed to the efficacy of EMDR. In addition, this case study lacked proper experimental control and independent verification of changes in CRIES-13 scores by blinded assessors. Therefore, the results of this case study must be interpreted with extreme caution and viewed as tentative and preliminary.

Early treatment interventions like TF-CBT and EMDR might be considered potentially useful in the PICU for ameliorating acute pathologic stress reactions and for sustaining low stress reactions over time. Future research should be devoted to evaluate the value of different treatment elements and to determine both optimal timing and length of early interventions. Based on empirical studies in children to date, TF-CBT can be recommended as early intervention [14]. However, if intrusive memories, flashbacks and nightmares are prominent, a combination of TF-CBT and EMDR could make a promising intervention for reducing acute

stress reactions. EMDR appears to have very strong effects on intrusions and distressing memories [18]. Besides the primary benefit of EMDR being effective, the procedure is also efficient, requiring only 3–5 hours of treatment, in the case that the traumatic memory is related to a single event. It should be noted, however, that there are still scientific concerns about EMDR, because convincing theoretical explanations for its effects are lacking so far [33]. Future research is necessary to determine how the effects of EMDR are functionally related to the procedures. Unfortunately, this case study is limited as case study design fails to shed light on the mechanisms that might have been responsible for the reported changes. Yet, the fact that these mechanisms are unclear should however not be used as an argument to withhold patients suffering from intrusive memories or nightmares from an effective treatment.

In recent literature, adaptations to the standard protocol are proposed when applying EMDR as an early intervention for acute stress reactions [34,35]. The memory of a recent trauma differs from that of a more distant trauma. Recent memories are more disorganized, fragmented and less integrated into a coherent narrative or sequence of events. Consequently, the memory may not be adequately represented by any single image from the event. Therefore different adapted protocols are developed, such as the Recent Event protocol [35]. One uncontrolled study in a general hospital setting showed a favourable effect of a single session of a modified EMDR protocol applied to accident and terror victims with acute stress reactions [34]. These protocols are currently still experimental and not yet validated by controlled research.

Conclusion

Sophie's case was presented as an example of a successful treatment that combined TF-CBT and EMDR. So far this is one of the first studies that examines EMDR in the paediatric setting and these findings should encourage RCT intervention studies with larger samples of children. This case illustrates that those who are involved in the caretaking of seriously injured and ill children have to be cautious for ASD in the patient. Moreover physicians should recognize acute stress reactions and identify children that could benefit from psychological treatment. Collaboration with a multidisciplinary team is essential and there is some evidence to support a possible role for EMDR as early treatment intervention when intrusions and distressing memories are prominent.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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